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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

| | |
|--|--|
| Date of mailing (day/month/year) 04 October 2000 (04.10.00) | |
| International application No. PCT/CA00/00173 | Applicant's or agent's file reference 82104-15 |
| International filing date (day/month/year) 21 February 2000 (21.02.00) | Priority date (day/month/year) 19 February 1999 (19.02.99) |
| Applicant SMIT, John | |

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

31 August 2000 (31.08.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

| | |
|--|---|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35 | Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38 |
|--|---|

PATENT COOPERATION TREATY

09/913414

From the INTERNATIONAL SEARCHING AUTHORITY

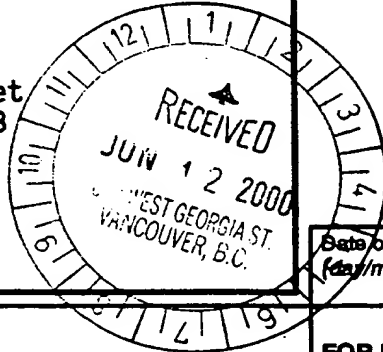
PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

To:

SMART & BIGGAR
Attn. ROBINSON, J.C.
Box 11560, Suite 2200
650 West Georgia Street
Vancouver, BC V6B 4N8
CANADA



Date of mailing
(day/month/year)

06/06/2000

Applicant's or agent's file reference

82104-15

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/CA 00/00173

International filing date

(day/month/year)

21/02/2000

Applicant

THE UNIVERSITY OF BRITISH COLUMBIA et al.

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Sandra De Jong-van Dam

09/913414

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

ROBINSON, J. Christopher
SMART & BIGGAR
Box 11560, Suite 2200
650 West Georgia Street
Vancouver, BC V6B 4N8
CANADA

by fax and post

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Fax : 604 682-0274

Date of mailing
(day/month/year)

02.07.2001

Applicant's or agent's file reference
82104-15

IMPORTANT NOTIFICATION

International application No.
PCT/CA00/00173

International filing date (day/month/year)
21/02/2000

Priority date (day/month/year)
19/02/1999

Applicant

THE UNIVERSITY OF BRITISH COLUMBIA et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer



Guerin, A

Tel. +49 89 2399-8061



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| | | | |
|--|---|---|--|
| Applicant's or agent's file reference 82104-15 | | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/CA00/00173 | International filing date (day/month/year) 21/02/2000 | Priority date (day/month/year) 19/02/1999 | |
| International Patent Classification (IPC) or national classification and IPC C12N15/74 | | | |
| Applicant THE UNIVERSITY OF BRITISH COLUMBIA et al. | | | |
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p> | | | |
| <p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input type="checkbox"/> Certain defects in the international applicationVIII <input checked="" type="checkbox"/> Certain observations on the international application | | | |
| Date of submission of the demand 31/08/2000 | | Date of completion of this report 02.07.2001 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | | Authorized officer BULCAO DE MELO ..., T Telephone No. +49 89 2399 8972  | |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/0017:

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-37 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/1 as originally filed

Sequence listing part of the description, pages:

1-7, filed with the letter of 05.04.00

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☒ furnished subsequently to this Authority in written form.
- ☒ furnished subsequently to this Authority in computer readable form.
- ☒ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

1. Reference is made to the following documents:

D1: WO-A-97 34000

D2: Journal of Bacteriology, Vol. 180, No. 12, 1998, pages 3062-3069

SECTION V

2. Novelty (Article 33(2) PCT)

The subject-matter of the present application does not appear to be disclosed in the prior art as defined in the regulations (Rule 64 (1)-(3) PCT).

Therefore, in view of such prior art the subject-matter of the present application has to be regarded as being new (Article 33 (2) PCT).

3. Inventive Step (Article 33 (3) PCT)

The present application does not satisfy the criterion set forth in Article 33 (3) PCT because the subject-matter of the present application (claims 1-16) does not involve an inventive step (Rule 65 (1) and (2) PCT).

The closest prior art to evaluate the inventiveness of the present application is document D1. D1 discloses an expression system for expression and secretion of heterologous polypeptides. Said system comprises DNA constructs which code for a chimeric protein in which the C-terminal region corresponds to the C-terminal secretion signal of a *Caulobacter* S-layer protein (RsaA), fused with a heterologous polypeptide. Said system also comprises bacterial cells containing, or which express said DNA constructs and secrete the resulting protein.

(See Abstract, examples and claims).

The difference between the closest prior art D1 and the claimed subject-matter is that the secretion signal coded by the DNA construct is endogenous.

Starting from D1, the underlying technical problem to be solved by the present application can be considered to lie in the provision of an alternative system for the expression and secretion of heterologous proteins.

The solution provided by the Applicant to solve the above problem is a system for the expression and secretion of heterologous proteins wherein the *Caulobacter* surface layer protein secretion signal is not present in *C. crescentus*.

D1 also discloses that the portion of the S-layer gene encoding the C-terminal region of the S-layer protein is highly conserved among different strains of *Caulobacter*. D1 further suggests that the use of any S-layer protein producing *Caulobacter* suits the same purposes as the use of *C. crescentus*.
(See page 8, lines 18-29 and paragraph bridging pages 16 and 17).

The person skilled in the art does not require any inventive skills to use the C-terminal region of a S-layer protein from a *Caulobacter* strain other than *C. crescentus* as the secretion signal. Furthermore, the person skilled in the art had a reasonable expectation of success for doing so, since said C-terminal region is highly conserved among *Caulobacter*.

Therefore, it is considered that the above solution does not involve an inventive step. Moreover, the expression system of the present application does not appear to provide any special, unexpected effect which can be considered an advantage over the expression system of the prior art (D1).

Claim 1 states that the host cell comprises at least one surface layer transport protein having an amino acid sequence homologous to SEQ ID NO:4 (RsaD) or SEQ ID NO:5 (RsaE). The term homologous includes the exact sequences. Since D1 discloses the expression and secretion of heterologous polypeptides in *C. crescentus*, *rsaD* and *rsaE* are obviously present.

Document D3 discloses that *C. crescentus* employs a type I secretion system which involves an uncleaved C-terminal secretion signal on the surface of the S-layer protein (RsaA) and several transport proteins (RsaD and RsaE) encoded by genes 3' to the surface layer protein gene (*rsaA*).

In view of the above, it appears that the use of the a nucleotide sequence encoding SEQ ID NO:4 (RsaD) or SEQ ID NO:5 (RsaE) for identifying a *Caulobacter* suitable for the expression and secretion of a heterologous polypeptide does not involve an inventive step.

4. Industrial Applicability (Article 33(4) PCT)

The subject-matter of the present application (claims 1-16) is susceptible of industrial applicability as defined in Article 33 (4) PCT.

SECTION VIII

5. The present application does not satisfy the criterion set forth in Article 6 PCT because the following claims are not clear.

5.1. The expression "not from *C. crescentus*" renders claim 1 unclear.

It should be noted that a foreign sequence can be introduced in a host cell and then extracted from that host cell. The feature "from" a certain cell or organism does not have a limiting effect on the scope of the claim.

The same applies to the expression "not present in *C. crescentus*" (claims 8, 9 and 16).

5.2. Moreover, claim 1 lacks clarity due to the expression "amino acid sequence homologous". This expression is not suitable to clearly define the scope of the claim because its vagueness in not indicating the type and degree of homology (structural and/or functional) makes it entirely opened to individual interpretation.

Although said expression is better understood when reading the description (page 15), the meaning of a claim should be clear from the wording of the claim alone (see the Guidelines for Preliminary Examination (PCT) CIII 4.2.).

5.3. The subject-matter of claim 5 lacks clarity due to the terms "hybridizes" and "hybridization".

These terms are vague and without technical significance because they fail to indicate the hybridization conditions. Therefore, these terms are entirely opened to individual interpretation.

The same applies to the term "selective", which is not suitable to clearly define the scope of the claim, because its vagueness makes it entirely opened to individual interpretation.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/CA00/00173

5.4. A protein (claim 16), regarded as a chemical product, should be clearly and unambiguously characterized by technical features, e.g. its amino acid sequence (cf. **Guidelines for Preliminary Examination CIII 4.7a**).

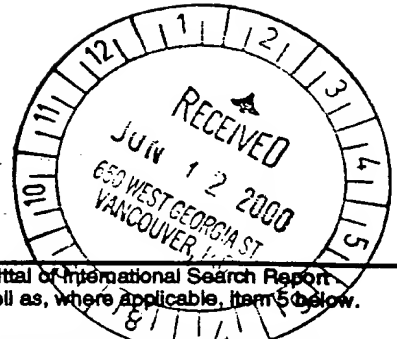
The producing microorganism of the polypeptide does not have a limiting effect on the scope of the claim.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)



| | | |
|---|---|--|
| Applicant's or agent's file reference 82104-15 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/CA 00/ 00173 | International filing date (day/month/year) 21/02/2000 | (Earliest) Priority Date (day/month/year) 19/02/1999 |
| Applicant THE UNIVERSITY OF BRITISH COLUMBIA et al. | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☒ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

INTERNATIONAL SEARCH REPORT

International Application No.

PC A 00/00173

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/74 C12N15/31 C07K14/21 C12N15/62 C12Q1/04
C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal BIOSIS MEDLIN EXTERNAL DATABASES WPI EPODOC PAJ NPL XPESP

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| Y | WO 97 34000 A (UNIV BRITISH COLUMBIA ;SMIT JOHN (CA); BINGLE WADE H (CA); NOMELLI) 18 September 1997 (1997-09-18) cited in the application page 8, line 18 -page 17 examples claims | 1-16 |
| Y | WALKER SG. ET AL.: "Isolation and comparison of the paracrystalline surface layer proteins of freshwater caulobacters." J BACTERIOL 1992 MAR;174(6):1783-92, XP000907209 cited in the application the whole document | 1-16 |

-/-



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the International filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

24 May 2000

Date of mailing of the International search report

06/06/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Andres, S

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/CA 00/00173

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| A | <p>AWRAM P ET AL: "THE CAULOBACTER CRESCENTUS PARACRYSTALLINE S-LAYER PROTEIN IS SECRETED BY AN ABC TRANSPORTER (TYPE I) SECRETION APPARATUS" JOURNAL OF BACTERIOLOGY, vol. 180, no. 12, June 1998 (1998-06), pages 3062-3069, XP000863052 ISSN: 0021-9193 cited in the application the whole document</p> | 1-16 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 00/00173

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| WO 9734000 A | 18-09-1997 | US 5976864 A | 02-11-1999 |
| | | US 5500353 A | 19-03-1996 |
| | | AU 2019497 A | 01-10-1997 |
| | | CA 2175549 A | 13-09-1997 |
| | | CA 2247805 A | 18-09-1997 |
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